Water Drops

Science Fun for Kids in the Water Environment — Fall 1996

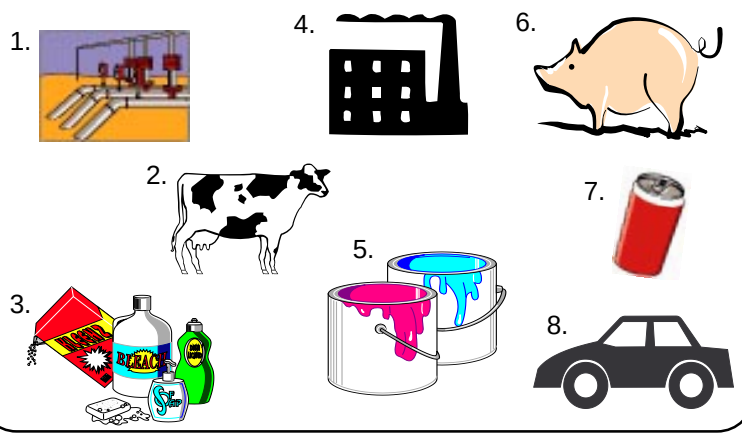
WATER POLLUTION

What is it? Have you ever walked by a stream or lake and seen trash floating on top of the water? Have you sometimes wondered what it was and where it came from? If you have, then you have seen water pollution. Water pollution is any substance introduced into a river, stream, lake, or ocean that harms the natural resources found in those environments. Sometimes water pollution is visible man-made objects such as plastic bags, plastic soda rings, fishing lines, balloons, and even shoes. Other times water pollution is invisible. Fertilizers from farms and chemicals from factories are two causes of water pollution which are hard to see. Sometimes, everyday activities such as flushing the toilet, washing dishes, washing our cars, or watering our lawns, also cause water pollution.

Where does it come from? Water pollution comes from several sources and is connected to the water cycle. Water pollution can come from direct human activities such as dumping trash and chemicals into the water, or it can be picked up through the water cycle. Imagine the path taken by a drop of rain from the time it hits the ground to when it reaches a river, ground water, or the ocean. As water runs over land it picks up pollutants from farms, streets and lawns. As it moves through the ground it may come in contact with pollutants that have leaked from landfills, illegal dumps or chemical spills. Also, water can pick up pollutants that were discharged directly into streams, rivers, or lakes by some businesses and manufacturing facilities. In the atmosphere, water vapor may form around pollutants from cars, factory smokestacks, and other pollution sources. When this water falls to Earth any pollutant that it picked up along the way can become part of the water pollution problem.

COMMON SOURCES OF WATER POLLUTION

Can you name them?



YOU AND PLANET EARTH

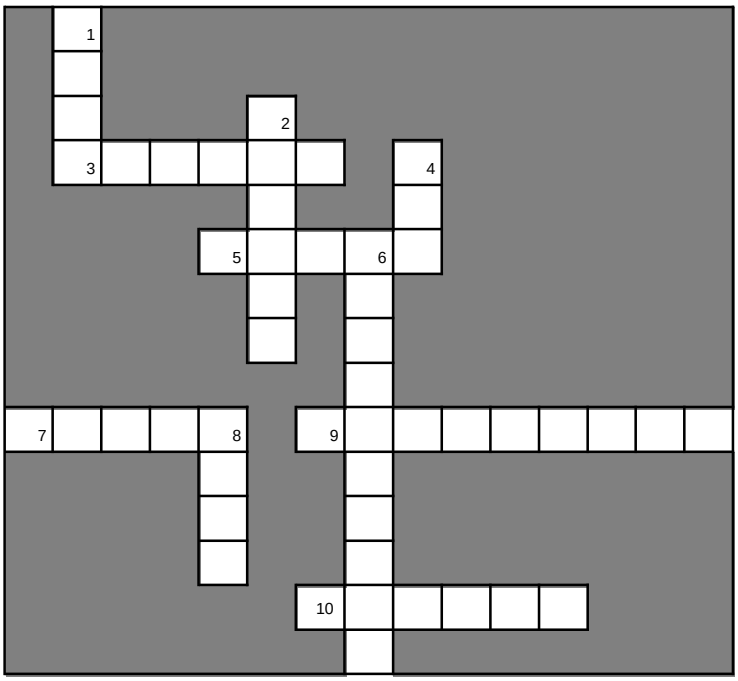
All living things - people, plants, and animals - depend on water. It is up to all of us to help keep our water clean. If we don't, our waters can become unsafe for swimming, fishing, and drinking. There is an abundance of water on Earth, but all the water in the world won't benefit us unless it is clean.

There are many ways to keep our waters clean. For example, planting plants and trees along streams and riverbanks, disposing of household chemicals properly, conserving water whenever possible, recycling, and properly disposing trash can help keep our waters clean. Communities and businesses help keep our water clean by building wastewater treatment plants in our home towns and at factories. These plants treat water by killing germs and bacteria and removing harmful chemicals.

So, the next time you wash a car, play near a stream, or take a bath, think about what is going to happen to the water that you are using right now. The water that you use today will be the same water that someone else will use tomorrow. Therefore, we must all do our part to keep our supply of water clean.

POLLUTION PUZZLE

How many clues can you figure out?



by Kyle Harrington

ACROSS

3. Wood comes from a _____.
5. Two-thirds of the earth is covered with _____.
7. A _____ is formed when water evaporates.
9. _____ destroys oceans, kills plants and wildlife, and is bad for our earth.
10. The Sahara is a famous _____.

DOWN

1. A _____ between two cultures.
2. A piece of land surrounded by water on all sides is an _____.
4. A lark flew into the _____.
6. When water on earth returns to the atmosphere, it _____.
8. Soil is another word for _____.

WORD FIND...

Words about water pollution are hidden in the block below. Words are hidden vertically, horizontally, or diagonally. See if you can find them.

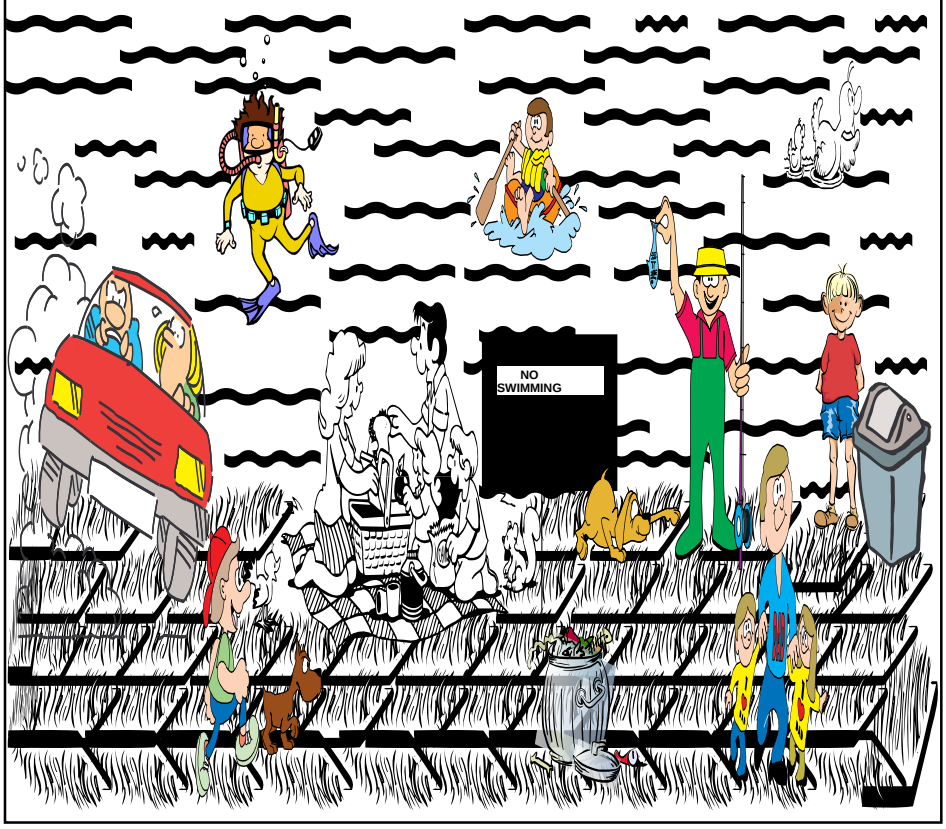
by Gregory Maheu

J I N G O L I N K O L O P J A K E N I K E L
S I N O M E P E Y G S O O C E A N N O T I N
D K O N E F I N N K Y L O M O R K O A B L R
R M O I B A T I F I N R I V E R T S W H A T
I I E A P L M E R E S P E C T I E R R I N Y
N R S R E M A L W A T E R L Y N C O I L D G
K A D O I G A F P O N D N G M E P L E A S E
I E J W F R B E B O U N G I N G R C P N O Q
N S S M O E A H A N D L A K E E I R E A L L
G S T I P E I N G B L A H H T R I C K F L O
P O N M S E Q U A P O L L U T I O N L U P N
R N G T H E C O P I P L Q L A M O M O L I N

Hidden Words: rain; ocean; water; drinking; sea; pollution; ice; swimming; river; lake; pond; respect

Games and Puzzles contributed by: *Students from the Aquinas Montessori School in Alexandria, Virginia.*

Can you identify three things wrong with this picture?



Nature

Nature is a home for most animals.
Nature has clean water for animals to live.
Nature is a cheerful place, quiet and sweet.
Nature had become a destroyed place.
Nature has been hunted a lot and animals shot.
Nature is a place you can love.
Help nature be a place with no trash.
Nature can be pretty, help please.
That was nature talking to me.
Listen to nature and help.
Nature can have beauty.

by Jennifer Metcalf

Trash Hurts Animals

Animals can be harmed by water pollution. Sometimes animals get entangled in trash found in oceans, lakes, and streams. Entanglement can impair an animal's ability to swim, which can cause drowning or difficulty in moving about, finding food, and escaping predators. Animals, like sea turtles and fish, often mistake trash items for food. Once eaten, items such as plastic bags, balloons, and plastic resin pellets can interfere with feeding habits and digestion.

Chemicals and other toxic pollutants are also considered trash. Chemicals dumped by man into rivers, lakes, streams, and oceans harm animals by polluting the habitat in which these creatures live. As a result, animals may not be able to find clean water to drink or get clean oxygen from the water to breath.

You can help nature's creatures by helping to keep trash and other pollutants out of the water cycle. You can also get involved in local water clean-ups at your school or community. To help keep nature's animals safe, it is up to you to get involved and to take action to preserve our most precious resource - ***clean water***.

WHAT YOU CAN DO TO HELP KEEP OUR WATER CLEAN...

Take part in regional river, lake, or coastal cleanup campaigns.

Alternative or recyclable materials should be used when possible.

Keep trash with you when on a boat or beach, then dispose of it properly.

Educate yourself and others about water conservation issues.

Always throw unwanted fishing line in a trash can, not in the water.

Cut loops from six-pack soda rings before disposing of them.

Toilets are not to be used to dispose of trash of any kind.

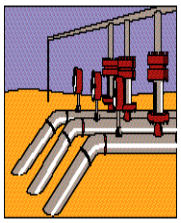
If your family and friends pollute, teach them how to properly dispose of trash.

Offer help to environmental and conservation groups and participate in community projects.

Notify your parents or the Coast Guard if you see boats dumping trash into the water.

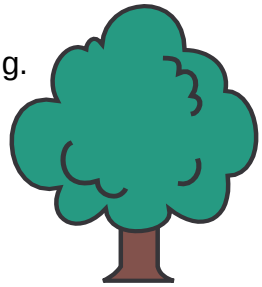
Which of these items are part of the Water Pollution Solution? *Which ones are not?*

a.

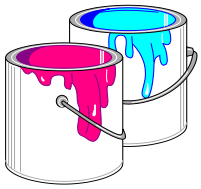


d.

g.



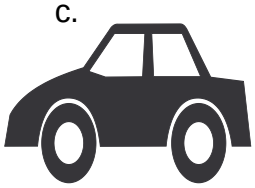
b.



e.

h.

c.



f.

i.

Answer Key:

Pollution Sources:

1. Manufacturing
2. Farming (Grazing)
3. Household Products
4. Factory
5. Paint
6. Farming
7. Littering
8. Car Exhaust

Word Find:

J I N G O L I N K O L O P J A K E N I K E L
S I N O M E P E Y C S O O C E A N N O T I N
D K O N E F I N W K Y L O M O R K O A B L R
R M O I B A T F I N R I V E R T S W H A T
I E A P L M E R E S P E C T I E R R I N Y
N R S R E M A L W A T E R L Y N C O I L D G
K A D O I G A F P O N D N G M E P L E A S E
E I W F R B E B O U N G I N G R C P N O Q
N S S M O E T H A N D L A K E E T R E A L L
G S T I P E I N G B L A H H T R I C K F L O
P O N M S E Q U A P O L L U T I O N L U P N
R N G T H E C O P I P L Q L A M O M O L I N

Crossword:

Across:
3. Forest
5. Water
7. Cloud
9. Pollution
10. Desert

Down
1. Gulf
2. Island
4. Air
6. Evaporates
8. Dirt

Water Pollution Solution:

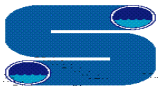
a. No - Factory pollution
b. No - Household chemicals
c. No - Car exhaust
d. Yes - Sewage treatment
e. Yes - Recycle, reuse
f. Yes - Get Involved
g. Yes - Plant trees to keep soil in place
h. Yes - Place litter in a trash can
i. Yes - You can make a difference

Picture Puzzle:

1. Car by the lake polluting the air
2. Overflowing trash can near the water
3. People swimming in a "No Swimming" area

How Does Wastewater Get Clean?

Sanitary Sewer System. Wastewater from homes, stores, and businesses runs through a large pipe that connects drain pipes to a large main sewer. This system collects waste water from all parts of the city and sends it to a wastewater treatment plant for cleaning and disposal.



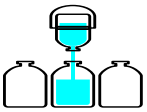
Screening Process. A large screen placed in a screening tank removes large solids such as sticks, rags, and cans from the water as it moves through the screening chamber.

Grit Chamber. Particles such as gravel, seeds, and small stones settle to the bottom of this tank and are removed.

Settling Tank. Smaller solids are given time to sink to the bottom where they form primary sludge which is sucked out and sent to a sludge digester.

Aeration Tank. In this tank, oxygen and bacteria are added to the water to destroy any remaining wastes.

Clarifier. Another large tank where the well-fed bacteria from the aeration tank sink to the bottom as secondary sludge. Sludge is treated and converted to biosolids used for fertilizers and soil conditioners.



Disinfection Treatment. At this point, water is disinfected with chlorine or other chemicals. The treated wastewater is then either sent to advanced treatment or is discharged into seas, rivers, or the ground. The primary sludge is then dried out and composted for use as fertilizer or soil conditioner.